

REMARKS

Claims 1-183 and 186-191 are now pending in the above-referenced patent application. Applicants respectfully request further consideration of these claims, in view of the amendments set forth above and the following remarks.

Amendments to the Specification

The specification has been amended to update the status of the parent application and various other related applications referenced therein. No new matter has been added.

Cancelled Claims

Claims 184 and 185 have been cancelled to advance the prosecution of the instant case. Applicants expressly reserve the right to refile the cancelled claims, without prejudice, in a continuing application. Applicants' cancellation of these claims should not, in any way, be considered as an admission with respect to any outstanding rejections applying to such claims, and Applicants hereby expressly deny any such interpretation. Likewise, Applicants cancellation of these claims should not, in any way, be considered as a surrender of any subject matter covered by the cancelled claims or any equivalents thereof, and Applicants hereby express their intent to pursue patent coverage for such subject matter and equivalents thereof.

Amended Claims

Claims 1, 2, 7, 15-21, 25-29, 34, 37, 56, 61, 117, 129, 141, 157, 169, 175, 177, 178 and 181-183 have each been amended, as follows.

Specifically, each of claims 1, 2, 177 and 178 have been amended to clarify that the feed composition subsystem comprises four or more mixing zones and that each of the flow restrictors provides a resistance to flow between the one or more reactant sources and one of the four or more mixing zones. Also, claims 1 and 177 have each been amended to require that the set of four or more flow restrictors includes four or more passive flow restrictors. Claims 2 and 178 has been amended, as well, to require that the set of four or more flow restrictors are integral with a substrate or with a microchip body mounted on a substrate. Support for each of these amendments may be found throughout the specification, including for example in paragraph [0049].

Claim 7 (flow partitioning) and claim 21 (pressure-partitioning) have each been rewritten in independent form, and amended to require that the set of four or more flow restrictors includes four or more passive flow restrictors. Support for each of these amendments may be found throughout the specification, including for example the as-filed claims and in paragraph [0049].

Claims 15-20, 25-29, 34, 37, 56, 61, 117, 129, 141, 157, 169, 175 and 181-183 have each been amended, without change in the scope thereof, to correct typographical and/or punctuation errors.

No new matter has been added.

New Claims

New claim 191 has been added to claim certain preferred embodiments of the invention. Support for this claim can be found throughout the specification, including for example in as-filed claim 30 and at paragraphs [0009] and [0020].

No new matter has been added.

Objection to Specification

The disclosure has been objected to due to informalities regarding the status of the parent application. (*See* paragraph 1 at page 2 of the Office action).

Applicants have amended the specification to obviate this objection.

Objection under 37 CFR §1.75(c)

Claims 184 and 185 have been objected to under 37 CFR §1.75(c) as being in improper form. (*See* paragraph 2 at page 2 of the Office action).

This objection is moot in view of these claims being canceled.

Rejection Under 35 U.S.C. § 102(b) (Creer *et al.*)

Claims 1-2, 30, 172 and 175-180 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Creer *et al.* (1986). (*See* paragraph 4 at page 2 of the Office action).

This basis for rejection is obviated in view of the amendments to the claims, considered together with the following remarks.

As amended, independent claims 1 and 177 require a set of four or more flow restrictors that are *passive* flow restrictors for control of flow, pressure and/or feed-composition. Creer *et al.* disclose only the use of *active* mass flow controllers, and as such, do not anticipate these claims. Claims 30, 172, 175 and 176 each depend from claim 1, and are therefore likewise not anticipated.

Independent claims 2 and 178, as amended, require that the set of four or more flow restrictors are integral with a substrate or with a microchip body mounted on a substrate. Creer *et al.* do not disclose such flow restrictors, and therefore does not anticipate these claims.

Since claims 179 and 180 are each dependent from claims 177 or 178, they are also not anticipated.

Applicants respectfully request that this basis for rejection be withdrawn.

Rejections Under 35 U.S.C. § 103(a) (Creer *et al.*, Calleja *et al.*, Soutgate *et al.*)

The Office action rejects claims 3-29, 31-71, 173-174, 181-183 and 186-190 under 35 U.S.C. § 103(a) based on Creer *et al.* (1986) in view of Calleja *et al.* (1995) and U.S. Patent No. 5,863,502 to Southgate *et al.*

Applicants respectfully traverse these rejections.

The Office does not establish a *prima facie* case of obviousness.

The law is clear that “to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art.” See MPEP Sec. 2143.03; *In re Royka*, 180 USPQ 580 (CCPA 1974). However, technically and commercially significant features of the presently-claimed inventions are not taught or suggested by the prior art.

Specifically, for example, the inventions defined by presently pending independent claims 1, 7, 21 and 177 each require a set of four or more *passive* flow restrictors. Creer *et al.* and Calleja *et al.* disclose only the use of conventional mass flow controllers. Southgate *et al.* do not make up for the deficiencies of Creer *et al.* and Calleja *et al.* in this regard. As such, these independent claims and claims depending therefrom are not obvious over the art of record.

Likewise, the inventions defined by independent claims 2 and 178 are each directed to parallel flow reactors and each require a set of four or more flow restrictors integral with a substrate or with one or more microchip bodies mounted on a substrate. Independent claim 186 requires a set of four or more flow restrictors having varying flow resistance, where the flow

restrictors are capillaries or are integral with a substrate or with one or more microchip bodies mounted on a substrate, and are effective for flow-partitioning, pressure-partitioning or feed-composition control in a parallel flow reactor. However, Creer *et al.* disclose a parallel reactor only having *separate, independent* mass flow controllers. Calleja *et al.* appear to disclose conventional reactors having commercial mass flow controllers for individually metering feed gasses and carrier gasses. (See p.445, 2nd column, 2nd paragraph of Calleja *et al.*). Southgate *et al.* do not make up for the deficiencies of Creer *et al.* and Calleja *et al.*, since the valving taught therein appears to be operated as isolation valves, not as flow-control valves. As such, these independent claims and claims depending therefrom are not obvious over the art of record.

Moreover, there is no motivation existing *in the art* that would have led a person of ordinary skill to modify the Creer *et al.* reference in a manner that would have led to Applicants' invention. Creer *et al.* and Calleja *et al.* are directed toward heterogenous catalysis, whereas Southgate *et al.* are directed toward PCR amplification. There is no rational basis for combining these references – without using impermissible hindsight.

It should be considered that Creer *et al.* suggest that further developments could be directed towards improvements in flow control, but they teach that such improvement could be realized using “electronic, digitally operated flow controllers” – active flow control elements. Hence, there is no suggestion in the art for modifying the parallel reactor of Creer *et al.* to (i) include passive flow restrictors, or to (ii) include flow restrictors integral with a substrate or a microchip body mounted on a substrate.

The Office action posits, nonetheless, that

“it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the parallel reactor system of Creer in a format as taught by Southgate *because of the size (volume) and meaningful results advantages taught by Southgate for the parallel reaction cassette of Southgate.*”

See paragraph 6 at pages 6-7 of the Office action.

However, the asserted rationale – the small size and desire for meaningful results – is too general to motivate a skilled artisan to arrive at the specific invention defined by Applicants' claims. See *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 5 USPQ2d 1529 (Fed. Cir. 1988); *In re Geiger*, 2 USPQ2d 1276 (Fed. Cir. 1987). The law requires a more specific suggestion in the art than merely the generalizations articulated in the Office action.

In addition, notably, the asserted generalities are not even necessarily applicable to the instant situation. For example, the volume of the reaction cavities of Applicants' invention is not limited in the independent claims and is preferably substantially larger than the preferred reactor volume of 1 μ l as taught by Southgate *et al.* (See, Col. 2, lines 21-26 of Southgate *et al.*); also, Southgate *et al.* expressly teach that meaningful results are assured by performing multiple, parallel reactions using the *same* reagents for each sample (See, Col. 2, lines 27-31 of Southgate *et al.*), which is not particularly relevant to Applicants' inventions (*e.g.*, involving varied feed distribution).

Hence, the inventions would not have been obviousness over the art of record. Applicants respectfully request that this basis for rejection be withdrawn.

Equivalents

The amendments to the claims and the arguments presented in supplemental response to the Office action have been made to claim subject matter which the Applicants regard as their invention. By such amendments, the Applicants in no way intend to surrender any range of equivalents beyond that which is needed to patentably distinguish the claimed invention as a whole over the prior art. Applicants expressly reserve patent coverage to all such equivalents that may fall in the range between applicants literal claim recitations and those combinations that would have been obvious in view of the prior art

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

The Examiner is hereby authorized to charge the fees required in connection with this Amendment A to Deposit Account No. 50-0496, in accordance with the Transmittal submitted herewith. The Examiner is also authorized to debit any other fees required in connection with this application, or to credit any overpayment of fees in connection with this application to Deposit Account No. 50-0496.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul A. Stone". The signature is stylized with a large, looping initial "P" and a distinct "A".

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